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GORDON RESEARCH CONFERENCE IN ORGANOMETALLIC CHEMISTRY  
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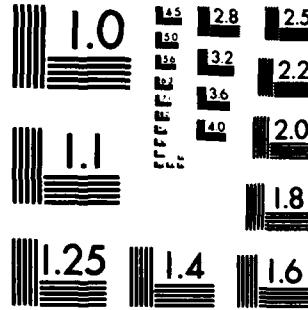
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## REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER <b>AFOSR-TR- 83 - 0241</b>		2. GOVT ACCESSION NO. <b>A127055</b>	3. RECIPIENT'S CATALOG NUMBER <b>(4)</b>
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7. AUTHOR(s)  Irving Mador		6. PERFORMING ORG. REPORT NUMBER  AFOSR-82-0223	
9. PERFORMING ORGANIZATION NAME AND ADDRESS  University of Rhode Island Pastore Chemical Laboratory Kinston, RI 02881		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS  61102F 2303/B2	
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20. Abstract (cont)

The conference encompassed 26 invited talks and 37 poster session presentation. Three papers concerned electron transfer of the Group I elements. Both anions and cations may be solvolyzed. The affinity for oxygen by certain transition metals (Zr, Mo) is an important driving force in organic rearrangement reactions. Breaking into a C-H bond still represents a formidable task, but it can be achieved with certain Ir complexes. The organometallic chemistry of La and of the actinides represents relatively unexplored territory. Organometallics are important in a number of commercial processes, e.g., fatty olefins, hexamethylene diamine. Synthesis of glycol from syn gas is promising, and CO<sub>2</sub> may substitute for CO as a building block. Clusters may range from bare metals, through di and trimers to multiply-bonded species. Tin, in both plus 2 and plus 4 valencies, has a very extensive organometallic chemistry.



A

Gordon Conference on Organometallic Chemistry

August 16-20, 1982, Andover, NH

Final Conference Report

The above named Conference encompassed 26 invited talks and 37 poster session presentations. Copies of the Scientific Program and Poster Session presentations are attached.

Three papers concerned electron transfer of the Group I elements. Both anions and cations may be solvolyzed. The affinity for oxygen by certain transition metals (Zr, Mo) is an important driving force in organic rearrangement reactions. Breaking into a C-H bond still represents a formidable task, but it can be achieved with certain Ir complexes. The organometallic chemistry of La and of the actinides represents relatively unexplored territory. Organometallics are important in a number of commercial processes, e.g., fatty olefins, hexamethylene diamine. Synthesis of glycol from syn gas is promising, and CO<sub>2</sub> may substitute for CO as a building block. Clusters may range from bare metals, through di and trimers to multiply-bonded species. Tin, in both +2 and +4 valencies, has a very extensive organometallic chemistry.

The AFSC funding was important in supplementing the allotment received from the Gordon Conferences. There was a great deal of interest in the meeting as evidenced by the receipt of approximately 225 applications for the 145 maximum attendees that could be accommodated. A list of attendees is enclosed. A meeting of the Steering Committee was held at which it was recommended that the Organometallic Conference be held on an annual basis. The recommendation was validated by a vote of the entire group. The Chairman for the next meeting is Jack Faller of Yale University and Vice-Chairman is Duane Dombek of Union Carbide.

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1982 GORDON RESEARCH CONFERENCE ON ORGANOMETALLIC CHEMISTRY

Schedule for Poster Displays

(Authors of poster displays are requested to be available in the vicinity of their display to answer questions from 5:15 to 5:45 p.m. on the days that their display is scheduled.)

Monday and Tuesday, August 16, 17 (Papers Nos. 1 through 16)

1. Mark Andrews and Chi-Wen F. Cheng, Brookhaven National Laboratory, "Heterometallacycles and  $\beta$ -Hydrogen Elimination in Catalytic Alkene Oxidation by Transition Metal Nitro and Related Complexes."
2. Thomas B. Brill and Shayne J. Landon, University of Delaware, "The Arbusov Reaction with Transition-Metal Organometallics."
3. Maurice Brookhart, R. Husk, S. Kegley, G. Williams and D. Smith, University of North Carolina, "Reactions of Electrophilic Ethyldene Complexes,  $Cp(CO)(L)Fe=CHCH_3^+$  ( $L$ =phosphines, CO) with Substituted Styrenes - Mechanistic Implications."
4. John W. Connolly, University of Missouri-Kansas City, "Addition of  $HFe(CO)_4SiCl_3$  to Isoprene - Is It Concerted?"
5. Thomas Bodnar and Alan Cutler, Rensselaer Polytechnic Institute, "Carbonylation Reactions of Electrophilic Alkyldene Complexes. Conversion of  $CpFe(CO)_2CH_2^+$  and Related Alkyldene Compounds to Carboalkoxymethyl Complexes."
6. James Markham and Alan Cutler, Wesleyan University, "Comparison of the Reactivities of the Organometallic Lewis Acidos  $CpMo(CO)_3PF_6$  and  $CpMo(CO)_2PF_6$  with  $Cp^{\text{IIO}}(CO)_3CH_3$ ."
7. Richard Eisenberg and Barbara J. Fisher, University of Rochester, "Functionalization of a Carbon-Hydrogen Bond Using  $IrH_3(CO)$  (dppe). Carbonylation of Benzene to Benzaldehyde."
8. Odile Eisenstein and Francois Volatron, University of Michigan, "An Organic Analogy to the Metathesis-Cyclopropanation Competition of Transition Metal Complexes. Preliminary ab initio Study of the Reaction of Phosphorus, Sulfur and Sulfoxide Ylids with Carbonyl Groups."
9. Richard D. Ernst, University of Utah, "Metal-Pentadienyl Compounds."
10. J. W. Faller, Yale University, "Control of Conformation and Regiochemistry by Electronic Effects."
11. Thomas C. Flood and John A. Statler, University of Southern California, "Rearrangement of (1-Methylcyclobutyl)platinum Complexes. Mild Carbon-Carbon Activation of a Strained Alkyl Ligand by Platinum(II)."
12. Warren P. Giering, Roy H. Magnuson and Randy E. Meiowitz, Boston University, "Oxidatively Promoted Alkyl to Acyl Migratory Insertion Reactions. Thermodynamics, Kinetics and Redox Catalysis."

13. John W. Hull, Jr. and Wayne L. Gladfelter, University of Minnesota, "Synthesis, Structure, and Reactivity of  $\text{Ru}(n^6\text{-C}_6\text{Me}_6)[n^4\text{-C}_6\text{Me}_4(\text{CH}_2)_2]$ . An Unusual Transition Metal o-Xylylene Complex."
14. Steven P. Hopper and Bernard Kanner, Union Carbide Corporation, "Silylation of Activated Acetylenes."
15. Russell P. Hughes, N. M. McGrady and D. E. Samkoff, Dartmouth College, "Octafluoroclooctatetraene Transition Metal Compounds."
16. William D. Jones and Frank J. Feher, University of Rochester, "Activation and Functionalization of C-H Bonds by Rhodium Complexes."
- 16a. H. Withers, D. Seyferth\*, MIT; J. D. Fellmann and P. E. Garrou, Dow Chemical, "The Synthesis of Poly-1,1'-ferrocenylenephenylphosphine Oligomers and Polymers and the Use of Such Materials as Catalyst Supports."

Wednesday and Thursday, August 18, 19 (Papers Nos. 17 through 35)

17. L. R. Beanan, Z. Abdul Rahman, J. B. Keister, H. J. Wasserman and M. R. Churchill, State University of New York at Buffalo, "Acetylene and Diene Reactions with Methylidynetriruthenium Clusters."
18. Jay A. Labinger, John N. Bonfiglio, David L. Grimmett, Steven T. Masuo, Eileen Shearin and Joel S. Miller, Occidental Research Corporation, "Amphoteric Ligands: Facile Migrations in Alkyl- and Hydridometal Carbonyl Complexes."
19. Mary Therese Zoeckler and Richard M. Laine, SRI International, "Catalytic Activation of the Silicon-Nitrogen Bond. Reactions of Silazanes with  $\text{CO}_2$ ."
20. Joseph S. Merola, Robert A. Gentile, Gerald B. Ansell, Michelle A. Modrick and Susan Zentz, Exxon Research and Engineering Co., "Bimetallic Titanium/Molybdenum Complexes Containing M-O-C-M' Bridges."
21. David Milstein, E. I. du Pont de Nemours & Co., "Cis-Hydridoalkyl-Rhodium and -Iridium Complexes Via Epoxides. Mechanism of Hydridoalkyl Reductive Elimination."
22. Michael E. Wright and Gregory O. Nelson, University of Arizona, "Evidence for Enhanced Reactivity in the Photofragmentation of the Bridged Dinuclear System  $\text{Me}_2\text{Si}[n^5\text{-C}_5\text{H}_4\text{Fe}(\text{CO})_2(n^1\text{-CH}_2\text{C}_6\text{H}_5)]_2$ ."
23. K. M. Nicholas, Boston College, "On the Possible Intermediacy of the Hydroxycarbene Complexes in Carbon Monoxide Reduction."
24. S. B. Jones, K. Howard and Jeffrey L. Petersen, West Virginia University, "Reactivity of Binuclear Zirconocene Hydrides."
25. Herman G. Richey, Jr., Edward K. Watkins and Mark A. Smith, Penn State Univ., "Reactions of Main Group Organometallic Compounds with Cyclopropenes."
26. Dennis Riley, The Procter & Gamble Company, "Synthesis of a New 20-Membered Hexathia Crown Ether and the Characterization of Its Novel Complexes with Rh(I)."

27. L. Chamberlain, J. C. Huffman and I. P. Rothwell, Purdue University, "Cyclotantalation of 2,6-di-tert-butylphenoxyde."
28. John P. Selegue, University of Kentucky, "Metallacumulenes."
29. Ayusman Sen, Ta-Wang Lai and Richard R. Thomas, Pennsylvania State University, "Interaction of Olefins with Electrophilic Transition Metal Centers."
30. S. G. Davies, S. J. Simpson and J. Hibberd, University of Oxford, "Homogeneous Hydrogenation of Carbon Monoxide."
31. Barrie A. Sosinsky, Rice University, "The Chemistry of Mixed Metal Tetracarbonyl Ferrates."
32. Barrie A. Sosinsky, Rice University, "Spectroscopic Study of Iron Carbonyl Clusters and Comparison to Chemisorbed Species on Iron Metal."
33. Kenneth S. Suslick, Paul F. Schubert, Hsien-Hau Wang and James W. Goodale, University of Illinois, "Organometallic Sonochemistry and Sonocatalysis."
34. Andrea L. Wayda, Bell Laboratories, "Derivative Chemistry of Cyclooctatetraenyl Lanthanide Complexes."
35. Richard M. Laine, Bong Rae Cho and Robert B. Wilson, Jr., SRI International, "Homogeneous Catalytic Reactions of Amines with Syngas."
36. A. St. Clair and Clifford P. Kubiak, Purdue University, "Photochemistry of di-Palladium Isonitrile Complexes."
37. Thomas E. Cole and Clifford P. Kubiak, Purdue University, "CO/O<sub>2</sub> Fuel Cells: Catalysis of CO Oxidation at Electrode/Electrolyte Interfaces."

GORDON RESEARCH CONFERENCES

ORGANOMETALLIC CHEMISTRY

August 16-20, 1982  
Proctor Academy, Andover, N.H.

I. Mador, Chairman  
J. Faller, Vice-Chairman

Monday, August 16

"Alkalides and Electrides- Salts Which Contain Alkali Metal Anions or Trapped Electrons"

H. Alper, Chairman  
University of Ottawa

"Structure and Dynamics of Alkyl Li Compounds"

J. Dye  
Michigan State

"Electron Transfer and Hydrogenation of Arenes"

G. Frankel  
Ohio State

"Migratory Insertion Reactions of Early Transition Metal Hydrides and Alkyls"

J. Lyons, Chairman  
Sun Tech

"Olefin Metathesis Catalysts"

J. Bercaw  
Cal. Tech.

J. Osborne  
Universite Louis Pasteur

Tuesday, August 17

"Organotransition Metal Intermediates Containing Reactive Single Carbon Ligands"

J. Labinger  
Occidental Res.

"Alkane Activation by Iridium Compounds"

J. Cooper  
Harvard

"Low-Valent Organolanthanide Chemistry"

R. Crabtree  
Yale

"New Stoichiometric and Catalytic Actinide Organometallic Chemistry"

W. Evans  
University of Chicago

"Linear Oligomerization of Olefins: Technical Applications of 1-Olefins and n-Octenes"

T. Marks  
Northwestern

"Reactivity and Structure of Olefin Zirconium Complexes"

G. Doyle, Chairman  
Dupont

W. Keim  
University of Aachen

G. Erker  
Ruhr-Universitat Bochum

Tuesday, August 17 (Continued)

"Hydrocyanation of Olefins"

W. Drinkard  
Dupont

Wednesday, August 18

"Metal Clusters Without Ligands: Fluxional Molecules with Multiple Bonding"

R. Eisenberg, Chairman  
University of Rochester

"Clusters in Catalysis" Basic Steps as Revealed by Triosmium Clusters"

M. Moskovits  
University of Toronto

"Catalytic Reactions Involving Metal-Carbon Multiple Bonds"

R. Adam  
Yale

"Organometallic Cluster Chemistry and Catalysis"

R. Shrock  
MIT

"Soluble and Surface Metal Alkyls"

J. Shapley  
University of Illinois

"Compounds with Metal-Metal and Metal-Carbon Bonds"

D. Seydel, Chairman  
MIT

Thursday, August 19

"Two-Carbon Products from Syn Gas Involving Homogeneous Catalysts"

O.T. Beachley, Jr. Chairman  
SUNY, Buffalo

"Reduction of  $\text{CO}_2$  by Metal Hydrides and Alkyls"

D. Dombeck  
Union Carbide

"Synthesis, Spectroscopic and Structural Properties of Organotin II and IV Species"

D. Darenbourg  
Tulane

"The Aqueous Chemistry of Biogenic Organometals"

J. Zuckerman  
University of Oklahoma

"Targeting Potential Anti-Cancer Organometallic Drugs and the Lide Serendipity"

R.H. Fish, Chairman  
University of California

F. Brinckman  
National Bureau of Standards

M. Cais  
Technion

Friday, August 20

F. Mares, Chairman  
Allied

"Formation and Properties of Transition Metal Carbonyl Radicals"

T. Brown  
University of Illinois

"Radical Reactions of Hydrido Cobalt and Manganese Carbonyls"

M. Orchin  
University of Cincinnati

"Synthesis, Structure and Reactivity of Organo-Transition Metal Complexes"

M. Green  
Oxford University

GORDON RESEARCH CONFERENCES

ORGANOMETALLIC CHEMISTRY

Proctor Academy, Andover, N.H.  
August 16-20, 1982

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